

SUBSPECIES OF *STENELLA LONGIROSTRIS*
(MAMMALIA: CETACEA: DELPHINIDAE)

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Abstract. — Three subspecies of *Stenella longirostris* are named, described and compared: *S. l. longirostris* from the world's tropical oceans, *S. l. orientalis* from tropical oceanic and coastal waters of the eastern Pacific, and *S. l. centroamericana* from Pacific coastal waters of Central America.

In a review of variation in *Stenella* spp. in eastern Pacific and Hawaiian waters (Perrin 1975a) I provisionally delineated four forms of the spinner dolphin:

1. "Costa Rican Spinner Porpoise, *Stenella longirostris* subsp. A (unnamed?),"
2. "Eastern Pacific Spinner Porpoise, *Stenella longirostris* subsp. B (unnamed?),"
3. "Whitebelly Spinner Porpoise, *Stenella longirostris* subsp. C (unnamed?)," and
4. "Hawaiian Spinner Porpoise, *Stenella longirostris* subsp. D (unnamed?)."

I did not assign trinomial names to the forms because of a lack of data for spinner dolphins in other parts of the world and uncertainty about the affinities of the holotype specimen of the species. (The holotype is a skull from an unknown locality.) Sufficient data have now accumulated to allow formal description and naming of three subspecies. Two of the subspecies correspond to Nos. 1 and 2 above, and the third includes No. 4. No. 3, the "whitebelly spinner," has proved to be a highly variable hybrid/intergrade between Nos. 2 and 4.

Skull measurements summarized below were taken as described in Perrin (1975a).

Museum acronyms. — ANSP, Philadelphia Academy of Natural Sciences, Pittsburgh, Pennsylvania; BMNH, British Museum (Natural History), London; CAS, California Academy of Sciences, San Francisco; DKC, personal collection of D. K. Caldwell, Marineland of Florida, St. Au-

gustine; EDM, collection of Edward D. Mitchell; LACM, Los Angeles County Museum of Natural History; LSUMZ, Louisiana State University Museum of Zoology, Baton Rouge; MCZ, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; MMBL, National Marine Mammal Laboratory, Seattle, Washington; MNHN, Museum National d'Histoire Naturelle, Paris; MVZ, Museum of Vertebrate Zoology, University of California, Berkeley; NSM, National Science Museum, Tokyo; RMNH, Rijksmuseum van Natuurlijke Historie, Leiden; SDMNH, San Diego Museum of Natural History, San Diego, California; SWFC, Marine Mammal Synoptic Collection, Southwest Fisheries Center, La Jolla, California; TCWC, Texas Cooperative Wildlife Collection, Texas A&M University, College Station; UCMP, Museum of Paleontology, University of California, Berkeley; UF, Florida State Museum, University of Florida, Gainesville; USNM, National Museum of Natural History, Washington, D.C.; ZMA, Zoologisch Museum, University of Amsterdam.

Stenella longirostris longirostris
(Gray, 1828)

Holotype. — RMNH 8676, skull only, unknown locality.

Referred specimens. — Hawaiian Islands: CAS 10529, 16455, 16456, 16457, 16458; LACM 27093, 27095, 54049, 54050, 54056,

54057, 54060, 72296; SWFC WFP605, WFP606, WFP623, WFP669, WFP670, WFP671; MCZ 51700; MMBL 1194; NSM 24615, 24815; USNM 339649, 504140, 504470. Christmas Island (Central Pacific): ANSP 19194, 19195. Washington Island: USNM 504251. Rangiroa (Tuamotu Islands): USNM 504252. Hiva Oa (Marquesa Islands): USNM 504253. Enewetok (Marshall Islands): USNM 395404. Western Pacific between 1 and 9°S, 147 and 160°E: NSM M24928, M24929, M24930, M24931, M24933, M24934, M25373. Western Pacific between 3 and 5°N, 142 and 150°E: NSM M25376, M24932. Japan: NSM M05100, M24800. Sri Lanka: BMNH 1891.10.13.2, 1948.4.20.1, 1949.10.27.1 and 2. Maldives Islands: BMNH 1959.7.9.1, 1959.7.9.3, 1959.7.9.4, 1959.7.9.5 and 1959.7.9.6. Ivory Coast: USNM 470557. Liberia: RMNH 21.720. Senegal: ZMA 12.263, 13.146, 13.147, IFAN2; EDM 784. North Carolina: USNM 291352, 504525. South Carolina: USNM 500859. Florida: DKC R-4-SLS; UF 7861, 18719; LSUMZ 17017; Texas: TCWC 28286, 29035; USNM 504224, 504233, 504433–504456. St. Vincent (Lesser Antilles): UF 18720–18724. Venezuela: ZMA 15.138.

Diagnosis.—A subspecies of *Stenella longirostris* characterized by distinct tripartite color pattern (Fig. 1), erect (in adult male) to falcate dorsal fin, relatively small post-anal hump, relatively large adult size (to about 215 cm; average about 180–190 cm) and relatively long (394–464 mm) and broad (zygomatic width 150–170 mm) adult skull.

Distribution.—Tropical and subtropical waters of the world. Replaced in the eastern Pacific by *S. longirostris orientalis* and *S. longirostris centroamericana* (described below) and possibly in Southeast Asia/northern Australasia by an undescribed dwarf subspecies (Perrin et al. 1989) with lower average tooth and vertebral counts and in the northwestern Indian Ocean/Red Sea by another locally adapted form (Robineau &

Rose 1983). Most common near coasts and islands (Gilpatrick et al. 1987).

Description of holotype.—Measurements (in mm) of the holotype skull: condylobasal length 426, length of rostrum 277, width of rostrum at base 76, width of rostrum at $\frac{1}{2}$ length 48, width of rostrum at $\frac{3}{4}$ length 36, greatest preorbital width 142, greatest post-orbital width 159, zygomatic width 156, parietal width 125, length of left temporal fossa 50, height of left temporal fossa 43, length of left upper toothrow 241, length of left ramus 368, height of left ramus 57. Teeth: upper left 54, upper right 53, lower left 52, lower right 54. External size, shape and coloration unknown.

Variation.—The color pattern is stable except in a broad zone of hybridization/intergradation with *S. longirostris orientalis* in the offshore eastern tropical Pacific (range of the “whitebelly spinner”—Perrin et al. 1985), where coloration and shape may be intermediate between those of the two forms (Fig. 1; Perrin 1972, Perrin, Sloan & Henderson 1979). In these specimens, the cape may be less distinct and the ventral margin of the dorsal overlay (terminology of Perrin 1972) stepped, ragged or grading into ventral spots.

Adult size may vary geographically (Perrin et al. 1989). The largest individual known was from Hawaii (CAS 16456, 213 cm). An adult male hybrid/intergrade from the eastern Pacific (SWFC BGB008) was 235 cm long, but this may have been a case of endocrinally induced gigantism; the next largest in the sample of 262 specimens from the population (including several from the same school) was over 30 cm shorter (Perrin & Gilpatrick 1990). The largest body of external measurements from a single region is from the tropical Atlantic (Perrin et al. 1981): 17 adult females ranged from 177 to 204 cm (average 188.9 cm) and 17 males from 173 to 208 cm (average 192.5 cm); four physically mature males were 192–208

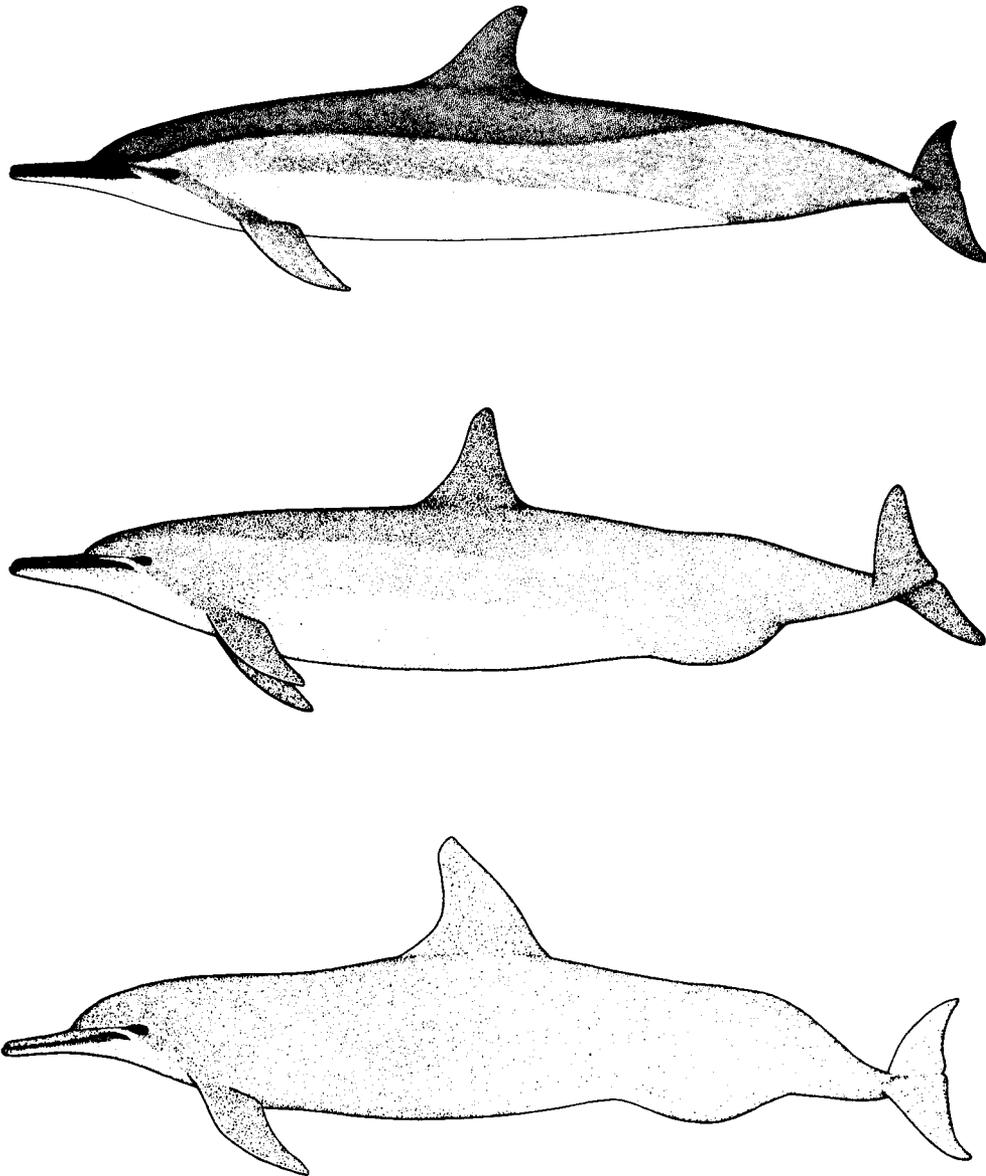


Fig. 1. Typical appearance of adult males of *Stenella longirostris longirostris* (top), *S. l. orientalis* (bottom) and a hybrid/intergrade (center). *S. l. centroamericana* is not illustrated, because the color pattern is not well known.

cm long and two females 196 and 201 cm long.

Skull size may also vary geographically (Table 1), but larger series from more lo-

calities will be necessary to demonstrate this adequately. The same is true of tooth counts (Table 1). Skulls from the hybrid/intergradation zone discussed above may be inter-

Table 1.—Means, standard deviations (for sample sizes ≥ 30), sample sizes (in parentheses), and maximum and minimum values for selected skull measurements and tooth counts for geographical series of cranially adult specimens of *Stenella longirostris longirostris* (from Perrin et al. 1989). Specimens of dwarf form from Southeast Asia excluded.

	Indian Ocean	Western Pacific	Central Pacific	Atlantic
Condylobasal length	409.2 (7) 394–430	420.1 (7) 411–431	436.9 (24) 417–464	427.0 \pm 13.10 (41) 395–458
Length of rostrum	264.9 (7) 250–281	272.1 (7) 262–281	282.6 (24) 263–304	276.8 \pm 11.00 (41) 251–304
Width of rostrum:				
At base	74.0 (7) 71–76	78.3 (7) 73–84	79.3 (24) 74–86	76.6 \pm 3.41 (42) 68–83
At 1/2 length	43.3 (7) 42–45	47.9 (7) 44–54	47.0 (24) 42–56	44.4 \pm 2.30 (41) 41–50
At 3/4 length	31.0 (7) 28–34	31.4 (5) 26–36	32.3 (24) 27–37	31.9 \pm 2.63 (39) 25–39
Width of PMXs at 1/2 length	19.4 (7) 18–20	21.0 (6) 19–23	21.1 (24) 17–23	21.0 \pm 2.32 (37) 17–32
Preorbital width	141.6 (7) 135–146	144.6 (5) 140–150	150.8 (24) 140–158	145.6 \pm 3.86 (42) 137–153
Postorbital width	155.4 (7) 153–160	160.8 (6) 155–169	165.2 (25) 158–172	161.1 \pm 4.03 (41) 152–169
Zygomatic width	154.0 (7) 151–160	156.2 (5) 152–161	163.5 (25) 154–171	159.2 \pm 3.92 (40) 150–167
Parietal width	128.7 (7) 122–133	127.6 (5) 125–131	131.4 (25) 122–140	130.5 \pm 4.25 (41) 121–140
Length of temporal fossa	50.0 (7) 46–58	47.4 (5) 44–51	53.3 (25) 45–61	48.1 \pm 3.30 (42) 42–56
Height of temporal fossa	41.4 (7) 39–45	41.0 (5) 36–44	42.9 (25) 37–50	38.3 \pm 3.52 (42) 30–49
Length of upper tooththrow	232.3 (7) 224–242	237.2 (6) 219–246	245.6 (24) 224–263	243.5 \pm 10.30 (41) 221–265
Length of ramus	352.0 (7) 366–370	366.3 (7) 360–371	372.4 (23) 352–399	368.4 \pm 11.68 (40) 343–399
Height of ramus	55.9 (7) 55–57	55.8 (6) 55–57	58.4 (23) 53–64	56.4 \pm 2.28 (41) 51–61
Upper teeth (per row)	52.9 (15) 49–59	53.3 (12) 48–61	55.0 (29) 50–62	55.4 \pm 3.01 (41) 48–64
Lower teeth (per row)	50.6 (8) 42–49	51.4 (15) 45–58	52.5 (29) 48–57	53.9 \pm 3.32 (43) 47–62

mediate in size and form between those in this subspecies and in *S. l. orientalis* (Perrin 1975a, Perrin, Sloan & Henderson 1979).

Remarks.—This subspecies includes the “Hawaiian Spinner Porpoise, *Stenella longirostris* subsp. D (unnamed?)” (Perrin

1975a). Hybrids/intergrades with *S. l. orientalis* (described below) correspond to the “Whitebelly Spinner Porpoise, *Stenella longirostris* subsp. C (unnamed)” (Perrin 1975a).

Genetic as well as morphological evi-

dence support the hypothesis that the highly variable "northern whitebelly spinner" and "southern whitebelly spinner" (Perrin, Sloan & Henderson 1979, Perrin et al. 1985) represent a zone of hybridization or intergradation between the two distinct forms to the west and the east; "whitebelly spinners" possessed no unique mitochondrial DNA haplotypes when compared with animals to the east (Dizon & Perrin 1987).

Hewitt (1988) noted that the width of many hybrid zones is about one hundred times the estimate of dispersal for the individual organisms. The zone of hybridization/intergradation for *S. l. longirostris* and *S. l. orientalis* (described below) is about 2000 km wide (Perrin et al. 1985). The former tends to inhabit coastal waters and waters around islands (Gilpatrick et al. 1987, Perrin et al. 1983), but tagged oceanic spinner dolphins in the eastern Pacific have moved at least 400 km (Perrin, Evans & Holts 1979). However, as pointed out by Hewitt, gene dispersal rate is likely to vary greatly with population density, structure and patchiness, and more information is needed on these before the significance of the relatively great dispersal distance of individuals relative to the width of the hybridization/intergradation zone can be weighed.

The holotype specimens of two junior synonyms of *S. longirostris* are probably of this form; both are relatively long and broad skulls from unknown localities. These are the holotypes of *Delphinus alope* Gray, 1846 (BMNH 847a; condylobasal length 412 mm, zygomatic width 166 mm) and *D. stenorhynchus* Gray, 1866 (BMNH 1471a; condylobasal length ca. 447 mm, zygomatic width ca. 167 mm). A third holotype specimen, that of *D. microps*, also from an unknown locality (BMNH 349a), is at the lower end of the known range of adult skull length (394 mm) and below (at 147 mm) the range of skull width (150 mm) for this

subspecies, suggesting that it belongs to a different form.

It seems likely that the very broadly distributed populations of this form will eventually prove to include several additional locally adapted races sufficiently distinct to merit recognition as subspecies. This seems to almost certainly be the case in Southeast Asia (Perrin et al. 1989) and is possibly the case in the northwestern Indian Ocean (Robineau & Rose 1983). The problem is simply one of material; cetacean specimens are very costly and difficult to collect, prepare and store. In the case of *S. longirostris* the species is known from several very large regions from only a single or a very few specimens; these areas include the Atlantic coast of South America, both coasts of Africa and the South Pacific.

If, as seems very likely, there proves to be a distinct (dwarf) form of the species in Southeast Asia, the name [*Delphinus*] *roseiventris* Wagner, 1846 may apply; the probable holotype specimen¹ MNHN 1882-104 is a small skull (condylobasal length 384 mm, zygomatic width 153 mm) from the Moluccas.

Use of the common name "Gray's spinner dolphin" is proposed for this, the nominate subspecies of *S. longirostris*.

Specimens examined.—In addition to the specimens designated as referred specimens above, the specimens listed in Perrin (1972, 1975a), Perrin, Sloan & Henderson (1979), and Perrin et al. (1981, 1989).

Stenella longirostris orientalis,
new subspecies

Holotype.—SDNHM 21427, physically mature male, total length 186 cm, from 12°20'N, 92°53'W (ca. 120 km off the coast

¹ The holotype specimens of Delphinidae at the MNNH are currently under review by D. Robineau of the Centre National d'Étude des Mammifères Marins.

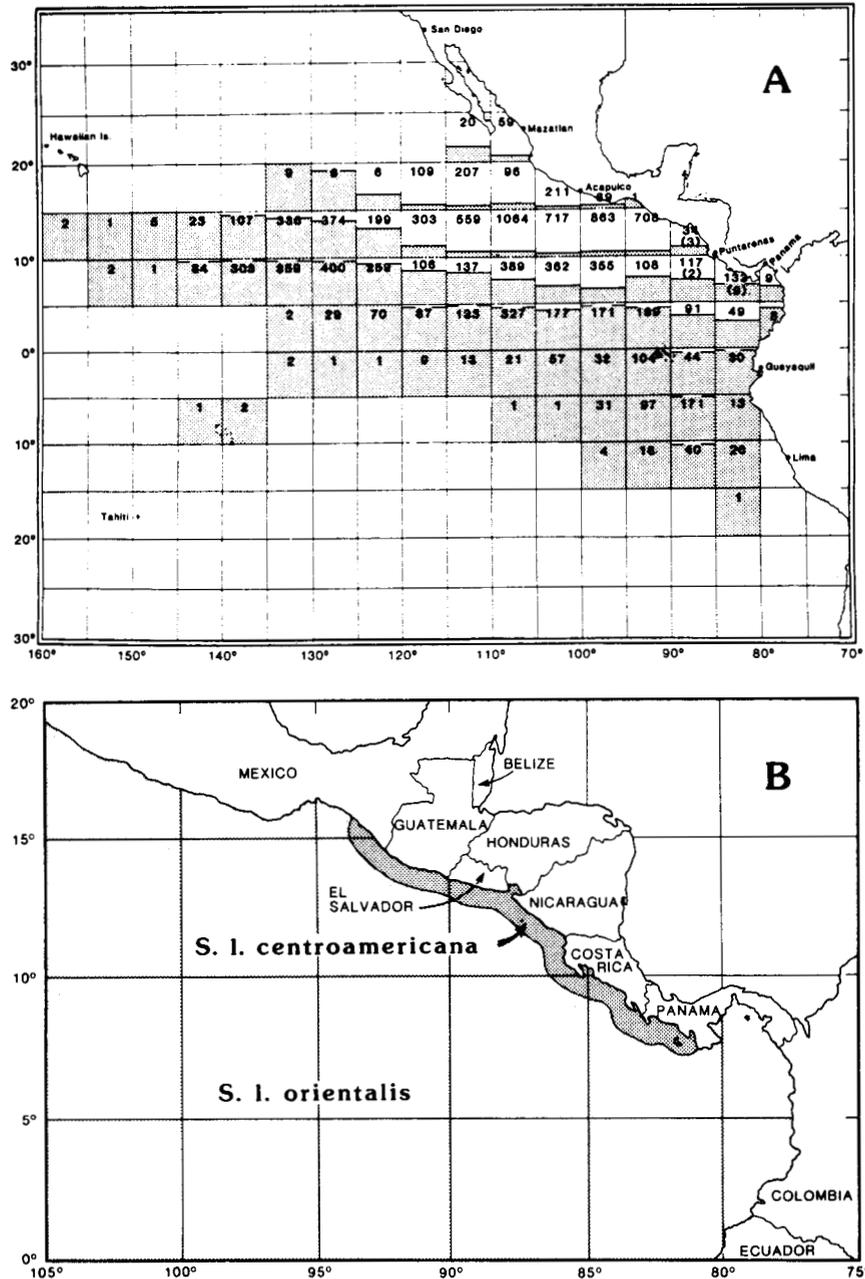


Fig. 2. Distribution of subspecies of *Stenella longirostris* in the eastern Pacific. Modified from Perrin et al. (1985). A. Schools sighted from tuna seiners and research vessels, identified to subspecies on the basis of predominant appearance of dolphins in school. Numbers indicate total number of schools sighted in square. Open portion of square = proportion of total sightings in the square that were of schools of the eastern spinner, *S. l. orientalis* or (on Central American coast, listed in parentheses) *S. l. centroamericana*. Shaded portion = *S. l. longirostris* (in west, southwest, and far south) and intergrades/hybrids between *S. l. longirostris* and *S. l. orientalis*. B. Approximate distributions of *S. l. orientalis* and *S. l. centroamericana* in Central American waters, based on records with voucher specimens.

of Guatemala in the eastern tropical Pacific), 10 Mar 1968, killed incidentally in tuna purse-seine fishery, complete skeleton, cast and external photographs. External photograph in Perrin (1972:989, fig. 9) and Leath-erwood et al. (1988:151, fig. 191).

Referred specimens.—USNM 395396, 395531, 39533–34 from 12°51'N, 93°18'W; USNM 395260, 395270–73, 395526, 395593, 7°11'N, 90°32'W; USNM 395274–75, SWFC 0025 (CV245), SWFC 0027 (CV240), UF18726, 7°20'N, 92°30'W; LACM 54052 (WAW50), ca. 21°16'N, 106°16'W; LACM 54036 (WAW54), ca. 18°N, 102°12'W; LACM 54039 (WAW60), 14°30'N, 99°35'W; LACM 64062 (RLB405), ca. 14°20'N, 107°20'W; USNM 324974–75, 12°32'N, 91°4'W; USNM 395930, 16°15'N, 98°55'W; CAS 15665, 13°30' to 14°6'N, 98° to 100°56'W; CAS 15666, 13°30' to 14°2'W, 99°47' to 102°2'W; MVZ 140641, 13°33' to 14°2'N, 99° to 108°W; CAS 15667–69, MVZ 140642 and 140645, UCMP 86287, 9°50' to 10°36'N, 99°47' to 102°2'W; USNM 395026, ca. 3°N, 87°W; USNM 396169, 7°21'N, 87°14'W; USNM 23302, Pacific Ocean between Panama and Galapagos Islands; USNM 88976, ca. 21°35'N, 106°40'W; LACM 54038 (WAW58), ca. 17°N, 100°45'W; SDMNH 21200, ca. 18°20'N, 106°40'W; CAS 13821, 13828, ca. 12°22'N, 80°50'W; MMBL 1967–102, ca. 21°43'N, 10°47'W.

Diagnosis.—A subspecies of *Stenella longirostris* characterized by uniform gray coloration dorsally and laterally (Fig. 1), with patches of white in axillary and genital areas, erect to forward-canted dorsal fin in adult male, relatively large post-anal hump, relatively small adult size (to 199 cm in adult males and 193 cm in adult females), and relatively short (351–407 mm) and narrow (zygomatic width 139–153 mm) skull.

Distribution.—Tropical coastal and oceanic waters of the eastern Pacific (Fig. 2) in a large triangular region, with the base of the triangle extending from about the tip of Baja California (ca. 24°N) in the north to ca. 10°S off the coast of Peru and the tip of

the triangle at about 145°W, 10°N. Most common off Mexico and Central America, in a region extending about 1000 km offshore (Perrin et al. 1985). Replaced south of the Gulf of Tehuantepec and north of the Bay of Panama in inshore coastal waters of extreme southern Mexico, Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica by *Stenella longirostris centroameri-cana* (described below).

Description of holotype.—The holotype specimen, a physically mature 186-cm male (all vertebral epiphyses fused to the centra) was dark gray dorsally and laterally, with the gular region slightly lighter gray and with patches of white in the axillary and genital regions (photograph in Perrin 1972:989, fig. 9). The dorsal fin was large and canted forward, and the post-anal hump was prominent; these features are preserved in the cast of the specimen in the SDMNH collection. Measurements (in mm) of the holotype skull: condylobasal length 401, length of rostrum 259, width of rostrum at base 74, width of rostrum at ½ length 46, width of rostrum at ¾ length 33, greatest preorbital width 133, greatest postorbital width 152, zygomatic width 150, parietal width 129, length of left temporal fossa 54, height of left temporal fossa 39, length of left upper toothrow 226, length of left ramus 346, height of left ramus 54. Teeth: upper left 49, upper right 48, lower left 52, lower right 52.

Variation.—The white axillary and genital patches may be confluent, with dark spots or patches between them. In a broad zone of hybridization/intergradation with *S. l. longirostris* in the offshore eastern tropical Pacific (the range of the “whitebelly spinner”—Perrin et al. 1985), coloration may be intermediate between those of the two forms (Fig. 1; Perrin 1972, 1975a; Perrin, Sloan & Henderson 1979).

Range in total length in 431 adult males (right testis \geq 100 g) was 160–199 cm (average 176.1 cm, standard deviation 6.12 cm); 697 adult females (at least one corpus in the ovaries) were 152–193 cm long (average 171.3 cm, standard deviation 5.99 cm) (Per-

Table 2.—Means, standard deviations (for sample sizes ≥ 30), sample sizes (in parentheses), and maximum and minimum values for selected skull measurements and tooth counts for *Stenella longirostris orientalis* and *S. l. centroamericana*. From Perrin et al. (1989).

	<i>S. l. orientalis</i>	<i>S. l. centroamericana</i>
Condylobasal length	386.5 (26) 351–407	428.6 (5) 416–439
Length of rostrum	245.5 (26) 218–262	279.0 (5) 268–288
Width of rostrum		
At base	72.1 (29) 66–77	72.4 (5) 70–77
At ½ length	41.6 (26) 37–47	42.0 (5) 39–43
At ¼ length	30.5 (26) 26–36	29.8 (5) 28–32
Width of PMXs at ½ length	19.6 (26) 16–22	21.4 (5) 21–22
Preorbital width	132.3 (29) 127–138	134.2 (5) 131–138
Postorbital width	148.1 (29) 140–154	151.2 (5) 149–152
Zygomatic width	146.4 (29) 139–153	150.4 (5) 149–152
Parietal width	125.9 (29) 119–132	128.8 (5) 127–130
Length of temporal fossa	48.5 (29) 41–57	49.6 (5) 46–57
Height of temporal fossa	36.6 (29) 29–47	36.4 (5) 34–42
Length of upper toothrow	212.2 (25) 192–299	245.0 (5) 238–255
Length of ramus	329.1 (27) 301–348	369.6 (5) 358–379
Height of ramus	52.3 (29) 47–57	55.2 (5) 53–57
Upper teeth (per row)	52.6 \pm 3.18 (32) 46–61	55.3 (5) 50–59
Lower teeth (per row)	50.5 \pm 2.39 (37) 45–56	56.3 (5) 51–59

rin et al. 1985). Ranges and averages for skull measurements and tooth counts are given in Table 2.

Additional data on ontogenetic, sexual,

individual and geographic variation in size, shape, coloration and skeleton are given in Perrin (1972, 1975a, b), Perrin, Sloan & Henderson (1979), Perrin et al. (1985), Schnell et al. (1982, 1985), Douglas et al. (1986), and Leatherwood et al. (1988).

Remarks.—This subspecies corresponds to the “Eastern Spinner Porpoise, *Stenella longirostris* subsp. B (unnamed?)” (Perrin 1975a). Hybrids/intergrades with *S. l. longirostris* correspond to the “Whitebelly Spinner Porpoise, *Stenella longirostris* subsp. C (unnamed?)” (Perrin 1975a).

Two alternative hypotheses have been proposed for the origin of this distinctive dolphin in the eastern Pacific: differentiation during isolation of a portion of the tropical eastern Pacific by a temperate-water barrier extending across the equator during a glacial period, or parapatric differentiation due to the peculiar oceanographic structure of the eastern Pacific (very shallow mixed layer and thick oxygen minimum layer that create an unique oceanic dolphin habitat—Au & Perryman 1985) and facilitated by complex social structure (Perrin et al. 1985).

The holotype specimen of the junior synonym *Delphinus microps* Gray, 1846 (BMNH 349a) is a small adult skull from an unknown locality; its measurements are within the range for *S. l. orientalis*. It may have come from the eastern Pacific, or it may have come from a different region where spinner dolphins are relatively small, e.g., Southeast Asia (Perrin et al. 1989). If future analyses were to determine that it came from the eastern Pacific, then the subspecies would bear the name *microps* rather than *orientalis*.

Continued use of the common name “eastern spinner dolphin” is proposed for this subspecies.

Specimens examined.—In addition to the specimens designated as referred specimens above, the specimens listed in Perrin (1972, 1975a), Perrin, Sloan & Henderson (1979), and Perrin et al. (1981, 1989).

Stenella longirostris centroamericana,
new subspecies

Holotype. — USNM 395933, skull and external measurements, adult male, one of three specimens collected at 9°47'N, 85°42'W (Gulf of Nicoya, Pacific coast of Costa Rica) on 26 Mar 1963 by D. W. Waller; original field number BCFBL,SD XIII-9.

Paratypes. — USNM 395931 and 395932 (same collection data as holotype).

Referred specimens. — USNM 395934 from 9°58'N, 86°3'W (outer side of Peninsula de Nicoya, Pacific coast of Costa Rica); SWFC 0025 (DAB100), 14°19'N, 93°10'W (ca. 80 km off coast of southern Mexico near border with Guatemala, at southern end of Gulf of Tehuantepec over continental shelf).

Diagnosis. — A subspecies of *Stenella longirostris* characterized by uniform gray coloration dorsally and laterally (ventral coloration poorly known, but photographs of animals in the wild and sketches by field observers do not show the well-defined axillary and genital white patches typical of *S. l. orientalis*), erect to forward-canted dorsal fin in adult male, relatively large post-anal hump, relatively large adult size (to 216 cm), and relatively long (416–439 mm) and narrow (zygomatic width 149–152 mm) skull.

Distribution. — Coastal waters to ca. 80 km offshore over the continental shelf south of the Gulf of Tehuantepec and north of the Bay of Panama off extreme southern Mexico, Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica (Fig. 2). Replaced to the north, south and west by *S. l. orientalis*.

Description of holotype. — Measurements (in mm) of the holotype skull: condylobasal length 416, length of rostrum 269, width of rostrum at base 71, width of rostrum at 1/2 length 43, width of rostrum at 3/4 length 30, greatest preorbital width 135, greatest post-orbital width 152, zygomatic width 152, parietal width 129, length of left temporal fos-

sa 48, height of left temporal fossa 36, length of upper left toothrow 239, length of left ramus 358, height of left ramus 56. Teeth: upper left 58, upper right 57 (estimated), lower left 57, lower right 57. External measurements (taken in field by D. W. Waller, following Norris 1961, in cm) of the carcass: total length 216.4, beak tip to melon 14.3, to angle of gape 28.3, to center of eye 32.0, to blowhole 32.1, to origin of flipper 46.3, to tip of dorsal fin 100.0, to umbilicus 99.7, axillary girth 69.2, posterior length of flipper 16.8, span of flukes 39.9.

Variation. — Three adult males (testis weight ≥ 100 g) were 212–216 cm long and 12 adult females (at least one corpus in ovaries) 193–211 cm (average 198.8 cm) (Perrin et al. 1985). Ranges and averages for skull measurements and tooth counts are given in Table 2. Additional data on osteological variation are given in Douglas et al. (1986), Perrin (1975a, b), Perrin et al. (1985), and Schnell et al. (1982, 1985).

Remarks. — This subspecies corresponds to the “Costa Rican spinner porpoise, *Stenella longirostris* subsp. A (unnamed?)” (Perrin 1975a). It differs from *S. l. orientalis* primarily in its relatively greater body size and its relatively long and narrow skull.

The few skulls available for this form can be easily discriminated from skulls of the other forms, based on simple scatterplots of length and width measurements or on scatterplots of scores for discriminant functions (Perrin 1975a), but it can be expected that overlap will be encountered when larger series of specimens become available.

The paucity of specimens is due to an apparent ecological difference between this form and *S. l. orientalis*. Large numbers of the latter are killed by tuna purse seiners because they are captured to catch yellowfin tuna (*Thunnus albacares*) that accompany them (Perrin 1975b); the former do not often “carry fish” and thus are only very rarely captured and killed.

The common name “Costa Rican spinner

dolphin" has been used for this form since 1975, but its range is now known to include the coastal waters of several nations. Therefore it is proposed that this subspecies be called the "Central American spinner dolphin."

Specimens examined.—In addition to the specimens designated above as paratypes, the specimens listed in Perrin (1972, 1975a), Perrin, Sloan & Henderson (1979), and Perrin et al. (1981, 1989).

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